RESTRICTED
Report No. TO-642a

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROPOSAL FOR A TECHNICAL ASSISTANCE AND ENGINEERING CREDIT FOR HIGHWAYS REPUBLIC OF KOREA

July 1, 1968

Projects Department

CURRENCY EQUIVALENTS

Currency unit - Won

US$1	=	Won 270
Won 1	=	US$0.0037
Won 1 million	=	US$3,703

FISCAL YEAR

January 1 - December 31

Units of Weights and Measures - Metric

KOREA

PROPOSED TECHNICAL ASSISTANCE AND ENGINEERING CREDIT FOR HIGHWAYS

TABLE OF CONTENTS

This report is based on the Bank-financed Transportation Survey Carried out by consultants in 1966, the findings of a Bank mission to Korea in June 1967 consisting of Messrs. Baig and Morris, and on the findings of an Economic Mission to Korea in March 1968.

KOREA

PROPOSED TECHNICAL ASSISTANCE AND ENGINEERING CREDIT FOR HIGHWAYS

1. SUMMARY

1.01 The Government of Korea has requested assistance in financing proposed highway studies and overseas training of staff, and it is recommended that the Association approve a credit of US$3.5 million for this purpose, with a term of 12 years including a four year period of grace. The proposed credit would cover the estimated foreign exchange cost of consulting services and overseas training; the Government of Korea would provide local costs at an estimated value of US$1 million equivalent.

2. BACKGROUND

2.01 In 1965 the Bank financed a transportation survey in Korea which was carried out by a joint venture of consultants: BCEOM (in cooperation with SOFRERAIL) from France, and NEDECO (in cooperation with NEI) from the Netherlands. The report was completed in December 1966. It drew attention to the lack of adequate roads and recommended that the Government emphasize road improvement in its development programs. It also stressed the need for carrying out major changes in the organization of highway administration, planning, construction and maintenance, and recommended setting up a national administration for public roads. The report also called for the setting up of an organization to coordinate transportation policy, and recommended highway and other transport investments over the next five years. The report has been adopted by the Government of Korea as a guide to transport policy, but more detailed studies are required for the effective implementation of the recommendations.

2.02 The Government in March 1967 requested the Bank/IDA to assist in financing feasibility studies for 2,200 km of national highways. It was the staff's view that about half that length would be more appropriate to the likely financial and administrative capacity of the Government. The UNDP was approached but informed the Bank that because of other commitments in Korea it could not finance the proposed feasibility studies in the near future. After reviewing the Government's proposals, the Bank/IDA suggested, and the Government agreed, that the feasibility studies be combined with those for highway reorganization and transport coordination into a single project. It was subsequently proposed to, and accepted by, the Government that detailed engineering should be carried out on selected lengths of roads. The scope of the studies, which it is proposed to finance by a technical assistance and engineering credit from the Association, is described below.

2.03 This report is based on the Bank-financed transportation survey carried out by consultants in 1966, the findings of an appraisal mission consisting of Messrs. Baig, Loan Officer, Asia Department, and Morris, Engineer, Projects Department, which visited Korea in June 1967, and on the findings of an Economic Mission to Korea in March 1968.

3. SCOPE OF THE PROJECT

3.01 A draft of the Terms of Reference for the various studies included in the project was prepared by the Bank/IDA and agreed in principle with the Government by a mission to Korea in June 1967. The mission recommended that the feasibility studies should cover about 1,160 km of highways. Detailed engineering will also be carried out, as part of the project, on sections of road shown by the feasibility studies to be of highest priority.

3.02 The Project, which would be carried out using qualified consultants, falls into six Sections:

(1) Highway Organization Study (duration about 12 months)

To review the present highway administration and to formulate detailed recommendations for its reorganization and for establishing a national administration for public roads.

(2) Transport Coordination Study (duration about 12 months concurrent with (1) above)

To review the present responsibilities of ministries and agencies concerned with transport policy and to formulate detailed recommendations for changes which should be made and for establishing an organization for the coordination of transport.

(3) Technical Assistance for Implementing Reorganization (duration about 12 months, subsequent to (1) and (2) above)

To provide technical assistance to the Government in establishing the national administration for public roads and the organization for transport coordination in accordance with the recommendations in (1) and (2) above.

(4) Highway Feasibility Studies (duration about 15 months, concurrent with (1) and (2) above)

To make studies of 1,160 km of roads selected on the basis of recommendations made by the consultants who carried out the original transportation survey and by the Government. The studies would be in two Phases:

Phase 1 (duration about 6 months)

Would consist of traffic forecasts and reconnaissance field surveys, recommendations for design standards and alignment selection, and an initial economic analysis for all the roads totaling 1,160 km.

Phase 2 (duration about 9 months, subsequent to Phase 1 above)

Would consist of more detailed field surveys, of preliminary engineering and a final economic analysis, to complete the feasibility studies of about 800 km of high priority roads, to be selected, in agreement with the Association, on the basis of the Phase 1 report.

(5) Detailed Engineering (duration about 18 months, subsequent to the feasibility studies)

To carry out detailed engineering and prepare bidding documents for sections of roads of highest priority, totalling between 300 and 500 km, to be selected, in agreement with the Association, on the basis of the feasibility studies in (4) above.

(6) Training Program (duration about 3 years, subsequent to organization studies in (1) and (2) above)

A program for overseas training of Korean staff of the national administration for public roads and the organization for transport coordination.

3.03 The proposed studies are intended to lead to a second project suitable for Bank or IDA financing, which would include (i) the construction of roads engineered under the first project; (ii) a continuation of the consultants' technical assistance to the Government for the establishment of the administration for public roads, introducing improved methods of road planning, construction and maintenance, and training of Korean staff; (iii) detailed engineering by consultants of additional roads confirmed as being of high priority by the feasibility studies described in para. 3.02(4); and (iv) the provision of equipment for highway maintenance. Such a project would, in turn, prepare the way for further projects.

4. HIGHWAY ORGANIZATION

4.01 Highway functions are at present dispersed among several ministries and the various Provincial Governments. As a result, responsibilities and lines of authority are confused and financial control is weak. For example, some construction funds are channelled through the Ministry of Construction while others are provided through the Ministry of Home Affairs. The Ministries of Commerce and Industry and of Agriculture and Forestry, as well as the Army, are also involved. The Ministry of Construction's headquarter establishment is weak and is not organized according to its main functions, one of which is highways. It has no central staff for undertaking design, which has to be carried out in six branch offices, or in Provincial Government Offices which are under the Ministry of Home Affairs; all these offices are inadequately staffed and equipped.

4.02 Road maintenance is the responsibility of Provincial Governments, under the Ministry of Home Affairs, and the Ministry of Construction has only an ineffective advisory role. As a result, insufficient maintenance work is done and it is of poor quality. Responsibility for mechanical equipment lies between the Ministry of Construction, which nominally has custody of most of the heavier types, and the Provincial Governments, which operate it. The repair shops of the Ministry of Construction and the Provincial Governments are all inadequately equipped, poorly stocked with spare parts and inadequately staffed.

4.03 The proposed highway organization study would examine in detail the present central, provincial, and local government organizations dealing with roads. It would include an analysis of their responsibilities for legislation, finance, administration, planning, construction and maintenance, and formulate comprehensive proposals for changes based on the establishment of a national administration for public roads. The study would also prepare a detailed plan for the organization of the new administration at headquarters and provincial and field levels. Estimates would be prepared of staff, equipment and installations required. The plan would also provide capital and recurrent cost estimates and a program for implementing the reorganization. The Government will review, with the Association, the recommendations of the consultants making the study, and will implement agreed changes in accordance with a program acceptable to the Association.

5. TRANSPORT COORDINATION

5.01 The Korea Transportation Survey Report proposed that a bureau should be established to study transport coordination problems. It pointed out that inland transport facilities have insufficient capacity to meet present needs. The economy has been growing rapidly in recent years. The rise in GNP in real terms was 13.4% in 1966, and 8.4% in 1967 (the reduced rate was caused by a severe drought); it is expected to continue at a rate of close to 10% annually until 1971, the end of the current five year development plan. Industrial output is increasing at about 20% annually. As a result, the demand for goods traffic is expected to rise at 19% per year, and for passenger traffic at 15% per year, until 1971. This will require a very large investment in transport facilities.

5.02 Emphasis in past transport investment has been heavily on railways, which have a network of over 3,500 km. The Transportation Survey Report recommended that railway investment should be mainly directed to increasing the capacity and efficiency of the present network rather than building new lines. In conformity with this view, in December 1967 an IDA credit of US$11 million was made to Korea to help finance the foreign exchange component of the purchase of additional hopper cars for coal, tank cars for oil, and consulting services.

5.03 In 1964 over 80% of freight traffic was carried by rail, only about 10% by road and 8% by coastal shipping. Even with passenger traffic, over 60% was carried by rail and only about 35% by road. The proportion of traffic carried by road is thus extraordinarily low. This is attributable to severe

restrictions on the import of road vehicles and the bad state of the roads. There were only about 42,000 vehicles at the end of 1965, which is one per 700 persons; this may be compared with one per 160 persons in Thailand and one per 140 persons in Iran. However, domestic vehicle assembly facilities are being greatly expanded to a capacity of 22,000 per year by 1969 and the Government is liberalizing the import of motor vehicles, and especially of components for local assembly. As a result the vehicle fleet had increased to 61,000 by the end of 1967. It is expected that the vehicle fleet will increase by about 16% per year.

5.04 The past imbalance in the development of rail and road transport, and the scale of necessary future investment, require a competent and independent transport coordination organization to examine critically the development programs of the various transport modes on a regular basis. It should advise the Government on the total allocation of resources to the transport sector as well as on their distribution, and also on the appropriate level of transport user charges.

5.05 The transport coordination study, to be included in the proposed project, would examine the present organizations and agencies dealing with transportation policy. It would analyse the present arrangements for the formulation of policy and its implementation and recommend appropriate changes including the establishment of a transport coordination organization, whose budget, staffing requirements, functions and relationships with other Government bodies would be defined. Recommendations would be made for any legislation needed. The Government will review the recommendations of the consultants and will implement changes agreed with the Association in accordance with a program acceptable to the Association.

6. TECHNICAL ASSISTANCE FOR IMPLEMENTING REORGANIZATION

6.01 Technical assistance would be needed to establish the national administration for public roads and the organization for transport coordination and to train their staffs. The project would include the provision by consultants of six advisers for varying periods during the first year after completion of the organization studies and reports. After the initial year of implementation, it will be apparent whether or not it is necessary to finance technical assistance for a further one or two years; if so, this could be financed from any subsequent engineering or construction loans or credits which may be made, or from any unallocated funds remaining in the proposed credit.

7. HIGHWAY FEASIBILITY STUDIES

7.01 There are about 34,000 km of public roads in Korea, of which less than 6% are paved. The primary highway system comprises 3,140 km, and the secondary system 5,050 km. Although the highway network is reasonably extensive, it is in very poor condition and urgently requires improvement if highway transport is to play its essential role. The existing roads are narrow, poorly aligned, badly surfaced and inadequately drained. Many new

bridges are required to replace existing bridges which are inadequate in size, width and load capacity and to replace fords which are often impassable in wet weather. At present there is little traffic congestion away from large towns but the condition of most of the roads reduces operating speeds to between 30 and 35 km/h.

7.02 The Transportation Survey Report recommended an investment program of Won 47 billion (US$175 million) for road development in the Second Five-Year Plan period 1967-71, including the pavement of over 3,000 km. The Government initially allocated only Won 30 billion (US$111 million), which included the pavement of about 1,650 km. However, overall economic development since the drafting of the Transportation Survey Report has been considerably faster than expected and, as a result, deficiencies in the highway system have become a bottleneck to further economic development. To accelerate highway improvement the Government recently decided to increase drastically allocations for highway investment. The total amount of funds allocated for this purpose during 1967-71 has been raised to Won 75 billion in 1968 prices, corresponding roughly to Won 60 billion on the same price basis as was used in the Transportation Survey Report. The economic mission which visited Korea in March feels that this increased highway program is in line with the country's overall development needs and should be possible from a financial point of view.

7.03 The project includes feasibility studies of national highways selected as being of high priority on the basis of the recommendations of the consultants who carried out the Transportation Survey, the Government, and the Bank mission to Korea. The studies would be carried out in two phases, as indicated in para. 3.02(4). The highways proposed for the Phase 1 study are (see the description given in Annex 1, and Map):

Seoul-Kangnung	250
Samchok-Kangnung-Sokcho	148
Pohang-Pusan-Yosu	380
Suncheon-Kwangju	94
Mokpo-Kwangju-Daejon	288
Total	1,160

Phase 2 of the studies, following immediately after Phase 1, would consist of more detailed analysis of about 800 km of the above roads shown to have a high priority.

8. DETAILED ENGINEERING

8.01 The project also includes the detailed engineering of sections of road, provisionally estimated to total between 300 and 500 km, found by the feasibility studies carried out under Phase 2 to have the highest priority. The work would consist of field surveys, detailed designs, preparation of specifications and bidding documents. This will give continuity in the engineering field work and thus prepare a future construction project for appraisal as early as possible. The detailed engineering work may be done

by the same consultants who carried out the feasibility studies, and might be commenced on any obviously high priority sections of road before completion of the final reports on all feasibility studies.

9. TRAINING PROGRAM

9.01 An amount of US$100,000 is included in the project to finance the foreign currency cost of academic and practical training courses overseas in the fields of highway engineering and administration and in transport economics. This would provide for about the first three years of a proposed Government four year program of training for which adequate facilities are not available in Korea.

9.02 The consultants, as part of the Highway Organization and Transport Coordination studies (see para 3.02 (1) (2) and (3) above), would be required to advise on staffing and training, including assisting the Government in preparing a program of overseas training on which the Association will have an opportunity to comment. The consultants will also assist in the selection of suitable candidates and general supervision of the early stages of the training program. The trainees would be required to undertake to serve the Government, on completion of their training program, for a period of at least two years.

10. EXECUTION OF THE PROJECT

10.01 In order to provide a firm base for the proposed amount of the credit, three draft priced contracts have already been negotiated between the Government and selected firms of consultants on the basis of drafts prepared by the Association. The Draft contracts are with (i) the French consultants BCEOM jointly with the Netherlands consultants NEDECO for the organization studies and services described in para 3.02 (1), (2) and (3); (ii) the American consultants Amman and Whitney International jointly with Trans-Asia Engineering Associates for studies of about 510 km of roads, described in para 3.02 (4); and (iii) the French consultants Ingeroute for studies of about 650 km of roads, described in para 3.02 (4). Further contracts would be negotiated at a suitable time between the Government and consultants acceptable to the Association for carrying out the detailed engineering described in para 3.02 (5).

10.02 The Government has agreed to consult with the Association before it carries out any works, other than maintenance or minor improvements, on roads included in the project. In the past the Government has tended to start constructing roads on which feasibility studies or engineering were still in progress, resulting in a lack of proper planning in highway development and sometimes in a misdirection of resources.

11. COST ESTIMATES

11.01 The estimated costs of the project are detailed in Annex 2. The foreign exchange costs of the consultants' staff, equipment and other items, and of the overseas training program, are expected to total about US$3,500,000 including a provision of about 10% for contingencies, and would be provided by the proposed credit. The Government will provide the local funds, services and facilities necessary to carry out the project; these are estimated at about US$500,000 equivalent in direct local costs, and a further US$500,000 equivalent of contributions in kind consisting of staff, including counterparts, and facilities. The cost estimates for the organization and highway feasibility studies are based on the draft priced contracts referred to in para 10.01, and are reasonable.

12. RECOMMENDATION

12.01 The proposed project of technical assistance and engineering services is soundly conceived. Consultants have been jointly selected by the Government and the Association from a list of firms which submitted proposals. Draft contracts, acceptable to the Association, between the selected consultants and the Government have been negotiated and the signing of such contracts would be a condition of credit effectiveness.

12.02 During negotiations, agreement was reached with the Government on the following principal points: (i) consultation with the Association on the selection of the roads for preliminary engineering under Phase 2 of the feasibility studies, and subsequently on the selection of roads for detailed engineering (para 3.02 (4) and (5)); (ii) the setting up of a national administration for public roads (para 4.03) and an organization for transport coordination (para 5.05); (iii) for refunding of the proposed credit, if so requested by the Assocation, out of the proceeds of any future Bank loan or IDA credit for construction of the roads to be engineered under the proposed credit.

12.03 The proposed project is considered suitable for an Association Credit of US$3.5 million with a term of 12 years including a 4 year period of grace.

July 1, 1968

KOREA

Proposed Technical Assistance and Engineering Credit for Highways

Description of Highways for which Feasibility Studies would be made

(a) Seoul-Kangnung (250 km)

1. This road connects Seoul, the capital city in the northwest, with the northeast coast, including the important Taebaeg coal and iron ore mining area which is in that region. Seoul had a population of 3.8 million in 1966 and it is expected to grow to 5 million within 20 years. It accounts for much of the country's industry and is a distribution center for imported goods and materials arriving through the port of Incheon, 40 km to the west. Kangnung on the east coast is a town of 65,000 population, likely to grow to 150,000 within 20 years. The existing road is unpaved, poorly aligned, narrow, rough and slow, speeds averaging only 30 to 35 km/h. There is a rail line from Seoul but it follows a roundabout route far to the south and is 427 km long compared with 250 km by road.

(b) Samchok-Kangnung-Sokcho (148 km)

2. The road runs along the east coast through a major mining area; there is also a substantial fishing industry and some tourist areas. Samchok, a town of 35,000 population at the southern end, is the port for an important coal mining area and there is also a large cement plant. Mukho, with a population of 50,000 is a port, largely for coal and cement, with a capacity of 2.5 million tons per year. From there the road passes through Kangnung and Yangyang (15,000 population) to the fishing port of Sokcho (65,000 population). Near Yangyang is the largest iron ore mining area in Korea and the ore is hauled along sections of the road for shipment at Yangyang. Sokcho handled nearly 400,000 tons of cargo and 40,000 tons of fish in 1966. The existing road is narrow, unpaved, poorly drained, with a rough surface and is inadequate for the present traffic.

(c) Pohang-Pusan-Yosu (380 km)

3. This road runs from Pohang, a port near the southern end of the east coast, through Pusan, the largest port, and through the largest industrial area of Korea, to the port of Yosu about midway along the south coast. Pohang has a population of 66,000; it is a port handling nearly 300,000 tons per year, a fishing port, and is to be the site of a new steel plant. The road continues through Kyongju, population 85,000, to Ulsan, a port which is being rapidly developed as a major industrial center; its population of 150,000 is expected to increase to 500,000 within twenty years. It has an oil refinery and plants in operation, or being built, for the production of fertilizers, synthetic fibers, aluminum, carbon black and a sugar refinery.

4. Pusan is the largest port in Korea, handling over 6 million tons of cargo per year, and the second largest city with a population of 1.5 million. From there the road passes through two more growing industrial towns, Jinhae, with a population of 80,000 and having plants producing fertilizer and plastics, and Masan, with a population of 160,000, which has a small steel mill and synthetic fiber and fish processing industries. The road continues through Jinju, population 105,000 and Suncheon, population 80,000, to the port of Yosu, population over 100,000, where an oil refinery is to be completed by the end of 1969.

5. The whole road from Pusan to Yosu is unpaved, except for the section between Ulsan and Pusan and a few short lengths through the towns. It is narrow, rough, sunken, poorly drained, with rough surfaces, and poorly aligned; it passes through many towns and villages where there is inadequate right-of-way causing congestion and accidents. Many bridges are too small, narrow and have insufficient load capacity.

(d) Suncheon-Kwangju (94 km)

6. This road links Kwangju, a provincial capital city with a population of 400,000 and the fifth largest city of Korea, with Suncheon, and hence with the port of Yosu and with the industrial southeast area. It also serves a coal-producing area between Kwangju and Suncheon. The Government plans to develop the triangle between Kwangju, Suncheon and Mokpo, on the southwest coast, as an industrial region. The existing road passes through a hilly area. It is unpaved, badly aligned, follows an unnecessarily long and roundabout route and is narrow, rough and inadequately drained.

(e) Mokpo-Kwangju-Daejon (288 km)

7. The road runs through the middle of the principal rice growing area of Korea as well as a number of large towns which have important industries. Mokpo has a population of 162,000 and is a port handling about 450,000 tons per year, including exports of rice, fertilizer and fish products. Kwangju, with a population of 400,000 (see para. 6) has textile and fertilizer plants and a motor vehicle assembly plant is to be completed by 1969; coal is produced in the area. The road then passes through Jeonju, a provincial capital with a population of 220,000; it has textile industries and a university. Further north, the road leads to Daejon, population 316,000, which is another provincial capital with textile plants and a tobacco processing industry.

8. The existing road is unpaved, except for a few short stretches in or adjacent to towns. It is inadequate even for present traffic; it is narrow, inadequately drained and rough. Considerable lengths require realignment and virtually the entire length needs reconstruction.

ANNEX 2

KOREA

PROPOSED TECHNICAL ASSISTANCE AND ENGINEERING CREDIT FOR HIGHWAYS

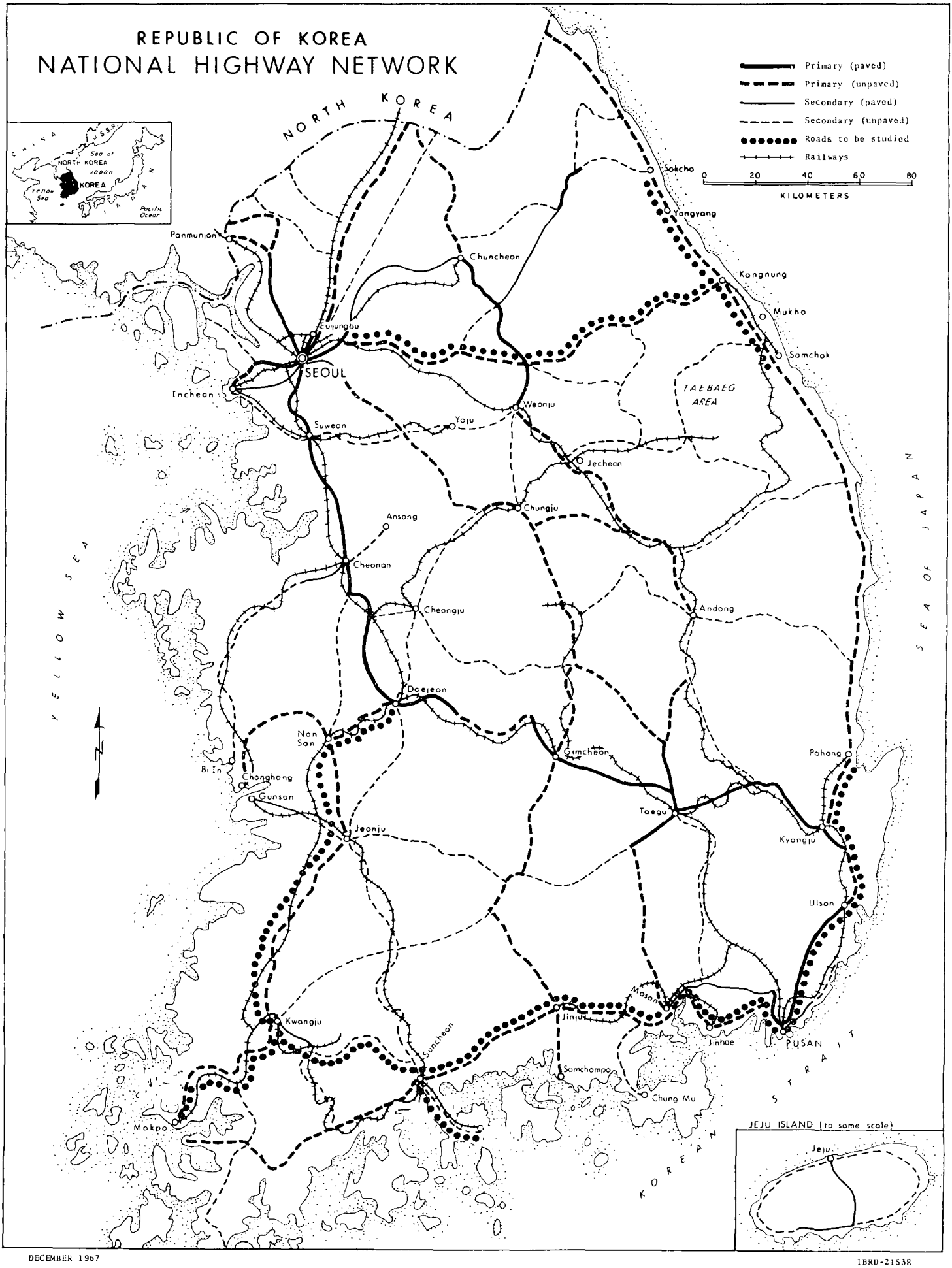
Estimate of Cost

A. Foreign Currency Costs (to be financed from the Credit)

		US$ Equivalent
1)	Highway Organization Study	550,000
2)	Transport Coordination Study	
3)	Technical Assistance for the Establishment of a National Administration for Public Roads and an Organization for Transport Coordination	
4)	Highway Feasibility Studies (1,160 km in Phase 1 and 800 km in Phase 2)	1,100,000
5)	Detailed Engineering (approximately 400 km)	1,400,000
6)	Training Program (approximately 20 man years)	100,000
7)	Unallocated (Contingency)	350,000
	Total (to be financed from Credit)	3,500,000

B. Local Currency Costs (to be financed by the Government)

1)	Government Cash Contribution for subsistence and direct local currency expenditures of the consultants	500,000
2)	Estimated value of Government contribution in kind, consisting of staff, including counterparts, and office and other facilities and services for carrying out the studies and engineering	500,000
	Total estimated Government Contribution	1,000,000


REPUBLIC OF KOREA
NATIONAL HIGHWAY NETWORK
Primary (paved)
Primary (unpaved)
Secondary (paved)
Secondary (unpaved)
Roads to be studied
Railways
0 20 40 60 80
KILOMETERS
NORTH KOREA
SEOUL
Incheon
Suweon
Panmunjon
Chuncheon
Eunjungbu
Sokcho
Yangyang
Kongnung
Mukho
Samchok
TAEBAEG AREA
Yoju
Weonju
Jechecn
Chungju
Ansong
Cheonan
Cheongju
Andong
Daejeon
Non San
Gimcheon
Pohang
Bi In
Chonghong
Gunsan
Taegu
Jeonju
Kyongju
Ulsan
Kwangju
Jinju
Masan
Jinhae
PUSAN
Suncheon
Samchompo
Chung Mu
Mokpo
YELLOW SEA
SEA OF JAPAN
KOREA STRAIT
JEJU ISLAND (to some scale)
Jeju
DECEMBER 1967
IBRD-2153R